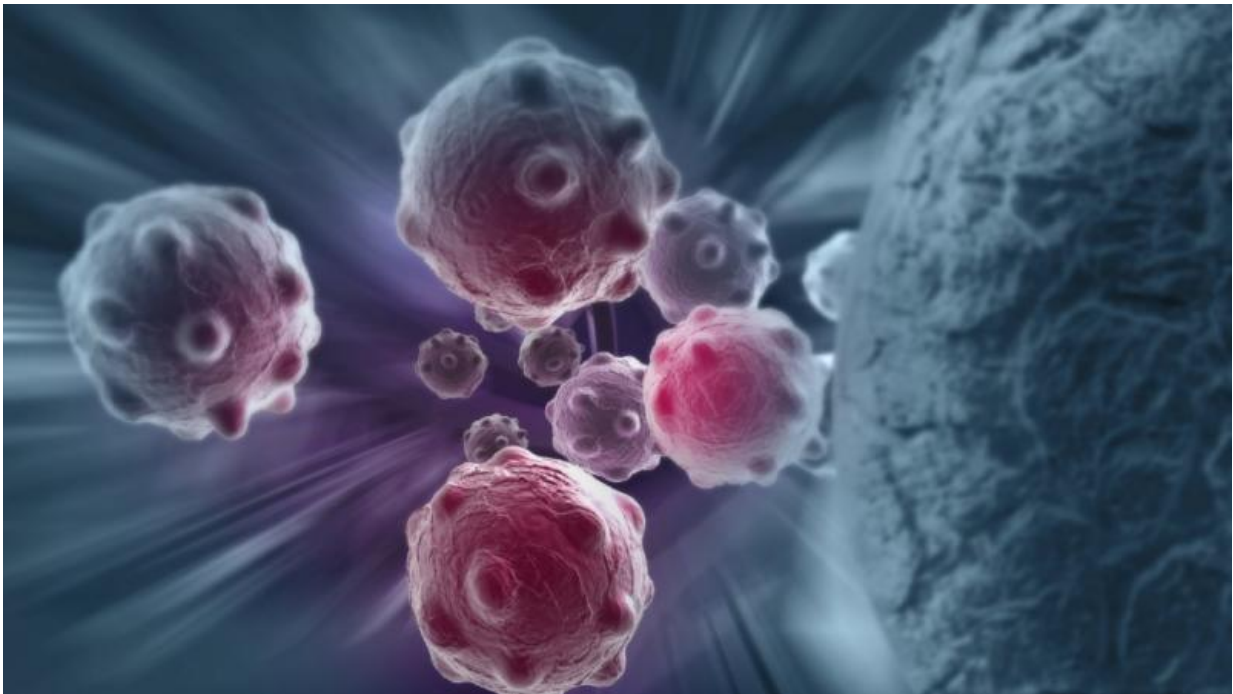


# Researchers identify way radiation may fight cancer cells escaping immune system

February 2 2016, by Brian Mullen

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A team of Georgia State University researchers is fighting cancers using a combination of therapies and recently found ways that radiation could maximize responses to novel immune-based therapeutic approaches to fight cancer.

"Radiation can increase the expression of genes, which allows the

immune system to attack tumor cells that may have previously escaped elimination," said Charlie Garnett Benson, assistant professor in the Department of Biology at Georgia State and lead author on the study, whose findings have been published in the International Journal of Oncology.

"These changes are a result of altered [gene expression](#) that results in different proteins being displayed on the tumor cell surface. Thus, tumor cells that survive [radiation](#) therapy are changed in a way that makes them more sensitive as targets for killer T cells and other [immune cells](#)."

The researchers revealed in this study that radiation is capable of changing the expression of such genes by influencing key enzymes that control whether a gene is open and expressed, or not. It is the first study to report that enhanced immune system attack of [tumor cells](#) can be due to changes in the epigenetic programs that organizes DNA and controls the expression of some genes.

"Previously, there were several pathways that were thought to control changes in gene expression within treated cancer cells and most of these were related to well described DNA repair pathways since radiation induces DNA damage," Benson said. "However, we showed that radiation can change the expression of genes not typically considered a part of the known DNA damage response pathways. More important, some of the modulated genes are known stimulators of killer T cell function."

The work being performed in Benson's lab is dedicated to understanding how the activity of immune cells is increased to fight cancers after [radiation treatment](#), and how best to apply [radiation therapy](#) to enhance cancer immunotherapy effectiveness.

"One of the major research thrusts in our lab is to examine the effects of

ionizing radiation on gene expression in diverse cells to gain further insights into the mechanistic link between radiation treatment and increased attack by immune cells," Benson said. "We will continue our work to better understand the basic immunology principles that could impact the design of immune therapies in combination with standard therapies for the treatment of cancer."

**More information:** Ercan Cacan et al. Radiation-induced modulation of immunogenic genes in tumor cells is regulated by both histone deacetylases and DNA methyltransferases, *International Journal of Oncology* (2015). [DOI: 10.3892/ijo.2015.3192](https://doi.org/10.3892/ijo.2015.3192)

Provided by Georgia State University

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